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EXAMINER
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SANDERS, AARON J

ART UNIT	PAPER NUMBER
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2168

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/710,356	Applicant(s) SHAUGHNESSY, STEVEN T.	
	Examiner Aaron J. Sanders	Art Unit 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-8, 10-19, 21-24 and 26-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8, 10-19, 21-24 and 26-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

This Office action has been issued in response to the amendment filed 3 January 2007.

Claims 1-3, 5-8, 10-19, 21-24, and 26-30 are pending. Applicant's arguments have been carefully and respectfully considered, and some are persuasive, while others are not.

Accordingly, objections and rejections have been removed where arguments were persuasive, but rejections have been maintained where arguments were not persuasive. Accordingly, claims 1-3, 5-8, 10-19, 21-24, and 26-30 are rejected, and this action has been made FINAL, as necessitated by amendment.

The amendments to the Specification and the Abstract that the Applicant has submitted are improper. Added text should be underlined and deleted text should be crossed-out or double bracketed. See 37 C.F.R. 1.121(b).

### ***Specification***

The use of numerous trademarks, including BTRIEVE, JAVA, and UNIX, has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks.

***Claim Objections***

Claims 12 and 28 are objected to because the limitation “reusing the cache view” lacks antecedent basis in the disclosure. “Reusing” can have more than one interpretation when discussing cache blocks and neither the instant specification nor the instant claims appear to define how it should be interpreted in the claims.

***Claim Rejections - 35 USC § 112 First Paragraph***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 12, 17, and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As per claims 1 and 17, the recited “cache view” is not enabled. In the instant claims, a “cache view” is defined as “comprising particular database blocks of the shared cache that record a view of a particular version of the database at a given point in time”. This appears to be a “snapshot” of the database and is not consistent with the definition of a cache. Applicant further defines a “cache view” in paragraph [0047] of the instant specification by saying that it is a process in which the transaction log is combined with the blocks of data in the cache to create a version of the database at an earlier state. This appears to be a rollback routine. Applicant

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discusses “cache views” as if they are objects, but has defined them as if they are processes. It is not clear how an object can also be a process.

As per claims 12 and 28, there does not appear to be any indication in the instant specification of how the “cache view” is “reused”.

***Claim Rejections - 35 USC § 112 Second Paragraph***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 8, 22, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6 and 22 disclose “an allocation bitmap”, however, claim 6 is a method claim and therefore cannot “provide” a device.

As per claims 8 and 24, the phrase, “a temporary database allocated to save off a modified block from the cache view” is unclear. It is not apparent what “to save off” means in the context of the claim.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3, 5-8, 10-19, 21-24, and 26-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-3, 5-8, 10-19, 21-24, and 26-30 are directed to a method and system for restoring databases to a consistent version. The claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomena) since it fails to produce a tangible result.

Specifically, the claimed subject matter does not produce a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulation of data. More specifically, the claimed subject matter provides for "returning a result comprising a transactionally consistent version of the given database supporting read-only uses". This produced result remains in the abstract and, thus, fails to achieve the required status of having real world value.

Further, claim 15 recites a "computer-readable medium having processor-executable instructions". However, just because the instructions are executable does not mean they have been executed. Also, claim 16 recites a "downloadable set of processor-executable instructions". Again, the instructions have not been downloaded, and could be downloaded on a non-statutory carrier wave.

As per claims 17-19, 21-24, and 26-30, the system does not require any hardware, making it software *per se*. As such, the instant claims are non-statutory.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-8, 10, 12, 13, 15-19, 21-24, 26, 28, and 29 are rejected under 35

U.S.C. 102(b) as being anticipated by Hayashi et al., U.S. Pat. 5,715,447.

The claims below have been interpreted to the best of the Examiner's ability due to the 35 U.S.C. 112 rejections.

As per claims 1-3, 5-8, 10, 12, 13, 15-19, 21-24, 26, 28, and 29, Hayashi et al. teach:

1. (Currently amended) In a database system employing a transaction log, an improved method for restoring databases to a consistent version, the method comprising:

providing a shared cache storing database blocks for use by multiple databases (See e.g. Fig. 4, "shared buffers 17");

for a read-only transaction of a given database, creating a cache view of a given database using the given database's transaction log, said cache view comprising particular database blocks of the shared cache that record a view of a particular version of the database at a given point in time (See e.g. Fig. 4, "log buffer 16" where, see col. 2, lines 20-27, "a log buffer for temporarily storing pre-update and post-update logs");

creating a shadow cache for storing any database blocks that overflow said cache view during use of the cache view by the read-only transaction (See e.g. Fig. 2 where, see col. 4, lines 8-18, "A buffer shared by the transactions is a bit map 30. The database 20 includes overflow

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pages 31. A database 20' is used to nonvolatilize the contents of the shared buffer. The bit map 30 controls overflow pages 31");

in conjunction with the cache view and the shadow cache, preserving a logical undo operation for the read-only transaction of the given database for logically undoing transactions which have begun but have yet to commit (See e.g. col. 5, lines 30-46, "When the contents of the updated page are completely written back to the allotted page on the disk, an original page is shifted to the allotted page in the table, and then a commitment is given to the transaction. A rollback is achieved by simply discarding the allotted page". It is noted that [0102] of Applicant's specification states, "For example, physical redo, physical undo, and logical undo are all concepts that exist in log-based transaction management systems" and are therefore admitted prior art); and

performing the logical undo operation in order to reconstruct a transactionally consistent prior version of the given database upon starting the read-only transaction, thereby returning a result comprising a transactionally consistent version of the given database supporting read-only uses (See e.g. col. 5, lines 30-46, "When the contents of the updated page are completely written back to the allotted page on the disk, an original page is shifted to the allotted page in the table, and then a commitment is given to the transaction. A rollback is achieved by simply discarding the allotted page").

2. (Currently amended) The method of claim 1, wherein during occurrence of the read-only transaction any database blocks associated with the cache view are not written from the shared cache to the given database (See e.g. Fig. 1 and col. 3, line 66 to col. 4, line 7, "The contents (i.e., pages) of the shared buffer are written back to the disk (i.e., data base 20) at a



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predetermined timing. Then, a log holding data updated by the last read or write operation will not be needed for recovering the contents of the buffer even if they are lost. The log buffer 16 temporarily stores pre-update and post-update logs of the shared buffers B1 and B2. The contents of the log buffer 16 are nonvolatilized by saving them in the log file 19 at a predetermined timing”).

3. (Original) The method of claim 1, wherein the shadow cache is implemented via a temporary database table (See e.g. Fig. 2, “database 20” and “overflow pages 31”).

4. (Canceled)

5. (Currently amended) The method of claim 1, wherein the shadow cache is used only in the event the cache view overflows the cache view (See e.g. Fig. 2 where, see col. 4, lines 8-18, “A buffer shared by the transactions is a bit map 30. The database 20 includes overflow pages 31. A database 20’ is used to nonvolatilize the contents of the shared buffer. The bit map 30 controls overflow pages 31”).

6. (Currently amended) The method of claim 1, further comprising:  
providing an allocation bitmap for indicating database blocks in use in the shadow cache (See e.g. Fig. 2, “bit map 30” and “overflow pages 31”).

7. (Currently amended) The method of claim 6, further comprising:  
upon completion of the read-only transaction, deleting the shadow cache by updating the allocation bitmap for allocated database blocks (See e.g. col. 4, lines 8-18, “any bit of the bit map 30 will be ON when a corresponding one of the overflow pages 31 is in use and OFF when the corresponding page is unused”).

8. (Currently amended) The method of claim 1, wherein the shadow cache comprises a temporary database table including a first column for maintaining a block number of a cache view block having undo/redo records applied to it and a second column for maintaining a block number in a temporary database allocated to save off a modified block from the cache view (See e.g. col. 5, lines 30-46, "The database contains page data and a table showing relationships between page numbers and locations on the disk").

9. (Canceled)

10. (Original) The method of claim 1, further comprising:  
upon termination of the read-only transaction, marking the cache view as closed (See e.g. Fig. 1 and col. 3, line 66 to col. 4, line 7, "The log buffer 16 temporarily stores pre-update and post-update logs of the shared buffers B1 and B2. The contents of the log buffer 16 are nonvolatilized by saving them in the log file 19 at a predetermined timing").

12. (Currently amended) The method of claim 1, further comprising:  
reusing the cache view created for the read-only transaction for other read-only transactions, which start within a specified period of time following the start of the read-only transaction (See e.g. col. 3, lines 9-17, "A log buffer 16 stores pre-update and post-update logs" where no new log is created unless there is a write, thus the last update log is used for the next transaction).

13. (Currently amended) The method of claim 1, further comprising:  
detecting the read-only transaction (See e.g. col. 1, lines 22-29, "Application programs running on a computer create transactions to query the database management system"); and

upon occurrence of write operations, adding back link log records to the database's transaction log that serve to link together blocks of the transaction log that pertain to the read-only transaction (See e.g. col. 3, line 66 to col. 4, line 7, "The contents (i.e., pages) of the shared buffer are written back to the disk (i.e., data base 20) at a predetermined timing. Then, a log holding data updated by the last read or write operation will not be needed for recovering the contents of the buffer even if they are lost" and Fig. 2, "log buffer 16" where the update logs are linked together).

15. (Original) A computer-readable medium having processor-executable instructions for performing the method of claim 1 (See e.g. col. 1, lines 61-63, "The present invention relates to a method of and an apparatus for" where an "apparatus" implies "A computer-readable medium having processor-executable instructions").

16. (Original) A downloadable set of processor-executable instructions for performing the method of claim 1 (See e.g. col. 1, lines 61-63, "The present invention relates to a method of and an apparatus for" where an "apparatus" implies "A downloadable set of processor-executable instructions").

17. (Currently amended) A database system capable of restoring databases to a consistent version, the system comprising:

a log manager module which manages a transaction log of the database system (See e.g. col. 2, lines 20-27, "a log buffer for temporarily storing pre-update and post-update logs, a log file for storing the pre-update and post-update logs");

a cache manager module for managing a shared cache that stores database blocks for use by multiple databases and creating a cache view of a given database created using the transaction

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log of the given database, said cache view being created in response to a read-only transaction of the given database, said cache view comprising particular database blocks of the shared cache that record a view of a particular version of the database at a given point in time; wherein the cache manager utilizes a shadow cache for storing any database blocks that overflow said cache view during use of the cache view by the read-only transaction (See e.g. Fig. 4, "shared buffers 17" and "log buffer 16" where, see col. 2, lines 20-27, "a log buffer for temporarily storing pre-update and post-update logs" and Fig. 2 where, see col. 4, lines 8-18, "A buffer shared by the transactions is a bit map 30. The database 20 includes overflow pages 31. A database 20' is used to nonvolatilize the contents of the shared buffer. The bit map 30 controls overflow pages 31"); and

a transaction manager module for performing read-only transactions of the database system and which performs a logical undo operation for the read-only transaction of the given database for logically undoing transactions which have begun but have yet to commit in order to reconstruct a transactionally consistent prior version of the given database upon starting the read-only transaction, thereby returning a result comprising a transactionally consistent version of the given database supporting read-only uses (See e.g. col. 5, lines 30-46, "When the contents of the updated page are completely written back to the allotted page on the disk, an original page is shifted to the allotted page in the table, and then a commitment is given to the transaction. A rollback is achieved by simply discarding the allotted page". It is noted that [0102] of Applicant's specification states, "For example, physical redo, physical undo, and logical undo are all concepts that exist in log-based transaction management systems" and are therefore admitted prior art).

18. (Currently amended) The system of claim 17, wherein during occurrence of the read-only transaction any database blocks associated with the cache view are not written from the shared cache to the given database (See e.g. col. 3, line 66 to col. 4, line 7, "The contents (i.e., pages) of the shared buffer are written back to the disk (i.e., data base 20) at a predetermined timing. Then, a log holding data updated by the last read or write operation will not be needed for recovering the contents of the buffer even if they are lost. The log buffer 16 temporarily stores pre-update and post-update logs of the shared buffers B1 and B2. The contents of the log buffer 16 are nonvolatilized by saving them in the log file 19 at a predetermined timing").

19. (Original) The system of claim 17, wherein the shadow cache is implemented via a temporary database table (See e.g. Fig. 2, "database 20" and "overflow pages 31").

20. (Canceled)

21. (Currently amended) The system of claim 17, wherein the shadow cache is used only in the event the cache view overflows the cache view (See e.g. Fig. 2 where, see col. 4, lines 8-18, "A buffer shared by the transactions is a bit map 30. The database 20 includes overflow pages 31. A database 20' is used to nonvolatilize the contents of the shared buffer. The bit map 30 controls overflow pages 31").

22. (Currently amended) The system of claim 17, wherein said cache manager maintains an allocation bitmap indicating database blocks in use in the shadow cache (See e.g. Fig. 2, "bit map 30" and "overflow pages 31").

23. (Currently amended) The system of claim 22, wherein said cache manager deletes the shadow cache by updating the allocation bitmap for allocated database blocks (See e.g. col. 4, lines 8-18, "any bit of the bit map 30 will be ON when a corresponding one of the overflow

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pages 31 is in use and OFF when the corresponding page is unused” where making all bits OFF would effectively remove them from the “shared buffer”).

24. (Currently amended) The system of claim 17, wherein the shadow cache comprises a temporary database table including a first column for maintaining a block number of a cache view block having undo/redo records applied to it and a second column for maintaining a block number in a temporary database allocated to save off a modified block from the cache view (See e.g. col. 5, lines 30-46, “The database contains page data and a table showing relationships between page numbers and locations on the disk”).

25. (Canceled)

26. (Currently amended) The system of claim 17, wherein said cache manager marks the cache view as closed, upon termination of the read-only transaction (See e.g. col. 3, line 66 to col. 4, line 7, “The log buffer 16 temporarily stores pre-update and post-update logs of the shared buffers B1 and B2. The contents of the log buffer 16 are nonvolatilized by saving them in the log file 19 at a predetermined timing”).

28. (Currently amended) The system of claim 17, wherein said cache manager reuses the cache view created for the read-only transaction for other read-only transactions which start within a specified period of time following the start of the read-only transaction (See e.g. col. 3, lines 9-17, “A log buffer 16 stores pre-update and post-update logs” where no new log is created unless there is a write, thus the last update log is used for the next transaction).

29. (Currently amended) The system of claim 17, wherein said log manager detects the read-only transaction, and adds back link log records to the transaction log that serve to link together blocks of the transaction log that pertain to the read-only transaction (See e.g. col. 1,

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lines 22-29, "Application programs running on a computer create transactions to query the database management system" and col. 3, line 66 to col. 4, line 7, "The contents (i.e., pages) of the shared buffer are written back to the disk (i.e., data base 20) at a predetermined timing. Then, a log holding data updated by the last read or write operation will not be needed for recovering the contents of the buffer even if they are lost" and Fig. 2, "log buffer 16" where the update logs are linked together).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. as applied to claims 1-3, 5-8, 10, 12, 13, 15-19, 21-24, 26, 28, and 29 above, in view of Raz, U.S. Pat. 5,701,480.

As per claims 14 and 30, Hayashi et al. disclose the subject matter upon which the instant claims depend, but do not appear to disclose "using the back link log records to skip portions of the transaction log that are irrelevant for undoing the read-only transaction". However, Raz does make such a disclosure (See col. 62, lines 3-17, "the computer 20 processes transactions using an "undo" recovery mechanism that provides very fast recovery because only the effects of failed transactions must be undone"). Hayashi et al. and Raz are analogous art because they both discuss cache operations. At the time of the invention, it would have been obvious to one of

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ordinary skill in the caching art to combine the teachings of the cited references because Hayashi's et al. teachings would have allowed Raz's method and system to provide a back link log record to skip portions of the transaction log that are irrelevant for undoing the read-only transaction so as to enable users to gain the ability to skip irrelevant portions of the transaction log (See col. 62, lines 3-17, "A considerable amount of processing time, however, is spent flushing updated records to non-volatile state memory and updating the non-volatile snapshot memory when each transaction is committed... For transactions that update the same records for multiple transactions, and transactions that are short and do not update many pages, a considerable fraction of the processing time is wasted by flushing the updated records to state memory at the end of every transaction").

Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. as applied to claims 1-3, 5-8, 10, 12, 13, 15-19, 21-24, 26, 28, and 29 above, and further in view of *The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition*, IEEE Press, 2000 (hereafter *IEEE*).

As per claims 11 and 27, Hayashi et al. disclose the subject matter upon which the instant claims depend, but do not appear to disclose a garbage collection for individual data blocks in the cache view. However, *IEEE* does make such a disclosure (See "garbage collection (B) A database reorganization technique in which the contents of a database are made more compact by physically deleting garbage such as records that have been deleted logically but remain physically in the database" and "cache (2) A small portion of high-speed memory used for temporary storage of frequently-used data, instructions, or operands"). Hayashi et al. and *IEEE*



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are analogous art because they both discuss database operations. At the time of the invention, it would have been obvious to one of ordinary skill in the database art to combine the teachings of the cited references because Hayashi's et al. teachings would have allowed *IEEE's* method and system to provide garbage collection for individual data blocks in the cache view so as to enable users to gain more compact database usage (See "garbage collection (B) A database reorganization technique in which the contents of a database are made more compact by physically deleting garbage such as records that have been deleted logically but remain physically in the database").

### ***Response to Arguments***

Applicant's arguments fail to comply with 37 C.F.R. 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. While it is possible that Hayashi et al. disclose "an approach that is fundamentally different from that of Applicant's", the Examiner contends that Hayashi et al. do disclose Applicant's claim limitations. If Applicant disagrees, then he should amend the claims to more specifically claim the subject matter that he regards as his invention, or specifically point out to the Examiner how Hayashi et al. do not teach the instant claims.

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***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Burgoon, U.S. Pat. 5,706,510; Kincaid et al., U.S. Pat. 6,192,376; Berkowitz et al., U.S. Pat. 6,457,021; and DeWitt, Jr. et al., U.S. Pat. 7,093,081.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron J. Sanders whose telephone number is 571-270-1016. The examiner can normally be reached on M-Th 8:00a-5:00p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vo Tim can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
AJS 

  
TIM VO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100